MICHIGAN WIND ENERGY STUDIES
PRELIMINARY PROPOSAL
FOR DISCUSSION PURPOSES

The purpose for this paper is to provide a basic description of a proposed Michigan Wind Energy Transmission Study, as a starting point for discussions amongst interested parties to help refine the study design. This paper presents only the first visioning and scoping activity for this project. Comments and suggestions are invited.

The first preliminary meeting on this subject will be held at MPSC Offices in Lansing on Friday, December 14, 2007. During the December 14 Michigan Wind Working Group Meeting, scheduled from 9:30 a.m. to noon at Michigan Public Service Commission Offices, Hearing Room E,[1] various participants in the Wind Energy Transmission Study (WETS) will provide a preliminary description of the planned study. A subsequent meeting to discuss the WETS will be held from 1:30 to 3:30 p.m.

Those unavailable to attend the meeting in person are invited to participate by toll-free telephone and/or webconference.

Number to Dial = 877-336-1829
Pass code = 2022874#

Webconference address = https://www.webmeeting.att.com

MPSC has a new teleconference/webconference service, through AT&T. The first time you use the Web Meeting Service, client software needs to be downloaded onto your computer. Please connect to the webmeeting website about 10 minutes before the meeting start time to allow ample time to load the new client software. You will need administrative permissions on your computer set to allow you to download and install new software.

INTRODUCTION: Recent Michigan and U.S. Congressional policy proposals for a possible state or national renewable portfolio standard (RPS), other energy policy changes, and possible global climate change initiatives have focused a lot more attention on wind energy development. Additional interest has been fueled by the installation and imminent start-up of Michigan's largest commercial wind installation to date, the Deere/Wolverine Harvest Wind Farm project now being completed in Huron County. Plus, Michigan presently has over 2,000 MW of wind projects, in 14 different Michigan counties, listed in the MISO Interconnection Queue.

As a result of all this recent interest, policy makers are asking questions like these: Is there enough wind in Michigan to support an RPS of different specific percentages by different specific years? Is there enough land area where wind can be developed, without running into serious siting problems? How high can or should an RPS goal be, before it will raise renewable resource costs by pulling too hard on a market that has just started to develop?

---

[1] Map and directions here: http://www.michigan.gov/mpsc/0,1607,7-159-16400_33353-42315--,00.html

And, for the purposes of this project, policy makers are asking questions like these: Can the Michigan electric grid accommodate this much new wind energy development? How much grid expansion is going to be necessary to accommodate planned Michigan wind developments? How should grid improvements be scheduled and made? Who will pay for those grid improvements?

Because of all this interest, the Michigan Wind Working Group and Michigan's electric transmission owning companies and electric utility companies have indicated interest in working together cooperatively to complete one or more studies needed to help answer such questions. As a preliminary step in this process, the MPSC Michigan Renewable Energy Program is convening a meeting among interested parties to discuss the completion of one or more studies in 2008.

PURPOSE OF THE DECEMBER 14 MEETING: The purpose of the organizing meeting on December 14, 2007, is to solicit input on the design and scope of one or more studies from all interested parties, begin to organize an advisory team to provide oversight for such studies, and further develop plans about how to proceed to pursue this work. All interested parties are invited to share their thoughts about this project at any time, either via participation in any of the public meetings that will be scheduled as this project progresses or by written or oral communications with any of the study participants. An email distribution list will be set up for this purpose, and instructions will soon be provided to explain how to sign up.[2] Our present goal is to have the major work on study definition and plans completed by mid-January.

What follows is a preliminary concept for this work, which has been developed by MPSC MREP staff after some consultation with a few interested parties. This is being shared with the MREP email distribution list and Michigan Wind Working Group with the intent of gathering additional ideas about the design and scope of a study or studies. The overall purpose for these studies, as MREP staff conceives it, is to (1) make the best utilization of existing available research capabilities of cooperating organizations to (2) apply the best available current knowledge to (3) make available the best information to help all interested parties understand the technical and economic potential for wind energy to contribute to Michigan's future.

WHAT THIS STUDY IS NOT: Before explaining further, MPSC MREP Staff wants to clearly point out that this study is not intended to provide a detailed plan for Michigan wind energy development. Rather, it proposes a fairly high-level and general overview of various plausible scenarios, intended to bracket something like low, medium, and high rates of wind energy development in Michigan over the coming 25 to 50 years or so. This study is not intended to provide information about specific siting for specific wind projects (sometimes referred to as "micro-siting".) This study is also not intended to

[2] See http://www.dleg.state.mi.us/mpsc/about/subscribe-listserv.htm. For the time being, please subscribe to MPSC-MREP in order to receive communications about Michigan wind energy studies. An announcement will be made to the MPSC-MREP list when a separate wind energy studies list has been created and is ready to accept new subscribers.

provide information about any specific transmission grid system upgrades that may be required for any specific wind farm installations in Michigan. It should be considered only as providing a best-educated approximation of transmission grid upgrades associated with some hypothetical wind development scenarios. It is not intended to supplant the feasibility studies and system studies that are completed in the normal course of events in association with transmission interconnection requests filed with the Midwest Independent System Operator (MISO), but it is hoped that work associated with ongoing transmission interconnection requests might provide useful insights and possibly work that can be utilized in completing the more general and higher-level study proposed here.[3]

PRELIMINARY OUTLINE: Here is a preliminary outline for a proposed Michigan Wind Energy Transmission Study, which is intended to be completed in 2008.

1. A Michigan Wind Energy Studies Team (MI-WEST) comprised of volunteers will be formed, to provide advice and data inputs for this study.

2. The MI-WEST Team will decide on quantities, locations, and timing of wind energy developments to be studied.

    2.1. Identify likely low, medium, and high wind energy production estimates for Michigan from now through 2030 or even 2050. The team will be responsible for the development of estimates for Michigan wind energy development. Those estimates will become input for the remainder of this study. Those estimates will incorporate and be guided by:

        2.1.1. RPS proposals (e.g., 10% by 2015, 20% by 25, 25% by 25, 20% of U.S. total electricity from wind by 2030?)
        2.1.2. The possibility of Michigan becoming a producer and exporter of wind energy to other states and countries.
        2.1.3. Identification of likely early, medium, and later locations for wind energy development. Use MSU-Land Policy Institute Wind Prospecting Tool analysis (see http://www.landpolicy.msu.edu/wpt/). Obtain input from NREL, Michigan Wind Working Group, wind developers, Michigan electricity suppliers, and MISO queue.
        2.1.4. Best available data on wind power availability (from NREL, etc.)
        2.1.5. Exclusion zones for all varieties of incompatible land uses
        2.1.6. Coordination with current and proposed off-shore studies
        2.1.7. Coordination with U.S. DOE/Windpowering America studies

[3] Most, but not all of Michigan's geography falls under the MISO operational footprint. You can learn more at the MISO website, http://www.midwestiso.org/page/Generator+Interconnection. The MISO Interconnection Queue presently includes over a dozen Michigan wind projects in 14 Michigan counties, totaling nearly 2,100 MW. Queue listing does not necessarily imply that a completed project will result, but it does give at least some indication of the growing interest in Michigan wind energy development.

3. Using the data provided by the MI-WEST as input, Michigan transmission owning companies (ITC and ATC) will perform preliminary system modeling to determine, roughly and generally speaking, what transmission grid upgrades and expansions would be expected to be necessary to accommodate the quantities, locations, and timing of wind development identified. This analysis should include, to the extent possible, considerations of:

    3.1. already existing planned and/or scheduled transmission system upgrades and expansions.
    3.2. "distributed" versus "transmitted" wind. – To what extent will it be helpful to model utility scale machines installed in large clusters (e.g., >20 MW "farms") versus smaller clusters (<20MW?). To what extent might medium scale (e.g., roughly 250 to 1,250 kW), or small scale (e.g., roughly 1 kW to 50 kW) wind generators be employed, and how would that effect modeling, if at all?
    3.3. geographic diversity and temporal diversity of wind resources. (MI-WEST will provide the best available wind-energy data to help with this analysis.)
    3.4. use of potential energy storage techniques, including Michigan's 1,800 MW, Ludington pumped storage facility.

4. Impacts and outcomes:

    4.1. general ideas about transmission upgrades and associated expenditures
    4.2. general ideas about likely utility rate impacts associated with the modeled wind developments (both transmission rates and generation rates)

5. Other Possible Studies and Publications to Consider for MI-WEST development in 2008 and beyond. What is the sequence of reports that might come out of this process, where we might consider this proposed transmission study to be step one? What are the possible/preferred/likely following steps? For examples:

    5.1. Guidelines? Handbooks? For wind developers? For communities? Siting/zoning?
    5.2. Public process education, decision-making?
    5.3. What are the economic impacts and tax revenue implications of the modeled wind energy scenarios?
    5.4. Similarities and differences in transmission planning for vis a vis biomass, hydro, solar, other renewables? Non-renewables?
    5.5. Siting research? Data needs?
    5.6. MISO Balancing Authority? W/ancillary services market starting June 1, 2008?
    5.7. How is this Michigan study related to the MISO MTEP process? The U.S. DOE Eastern Interconnect study? MGA goals and objectives?